AMENDMENTS TO THE CLAIMS

This set of claims replaces all previous versions.

1. (Currently amended) A ~~polypeptide, which polypeptide:~~

~~(i) comprises~~ polypeptide selected from the group consisting of the amino acid sequence as recited in SEQ ID NO:2, ~~or~~

~~(ii) is~~ a fragment ~~thereof~~ of SEQ ID NO:2 having 5-HT3 protein function ~~or~~

, a fragment having an antigenic determinant in common with ~~the polypeptide of (i); or~~ SEQ ID NO: 2,

~~(iii) is~~ a functional equivalent ~~of (i) or (ii)~~ of the amino acid sequence of SEQ ID NO:2, a functional equivalent of a fragment of SEQ ID NO:2 having 5-HT3 protein function, and functional equivalent of a fragment having an antigenic determinant in common with SEQ ID NO:2.

2. (Original) A polypeptide or a functional equivalent which is a 5-HT3 receptor subunit.

3. (Currently amended) ~~A polypeptide~~ The polypeptide or ~~a functional~~ the functional equivalent according to claim 2 which forms a homopentamer.

4. (Currently amended) ~~A polypeptide~~ The polypeptide or ~~a functional~~ the functional equivalent according to claim 2 which forms a heteropentamer.

5. (Currently amended) ~~A polypeptide~~ The polypeptide or ~~a functional~~ the functional equivalent according to claim 4, wherein the heteropentamer includes subunits from other ligand-gated ion channels.

6. (Currently amended) ~~A polypeptide~~ The polypeptide or ~~a functional~~ the functional equivalent according to claim 5, wherein the heteropentamer includes subunits from other 5-HT3 receptors.

7. (Currently amended) ~~A polypeptide~~ The polypeptide or ~~a functional~~ the functional equivalent according to ~~claim 1(iii) or claims 2 to 6,~~ claim 1, which polypeptide is homologous to the amino acid sequence as recited in SEQ ID NO:2, and has 5-HT3 receptor activity.

8. (Canceled)

9. (Currently amended) ~~A functional~~ The functional equivalent according to ~~any one of claims 1-8~~ claim 1, which exhibits significant structural homology with a polypeptide having the amino acid sequence given in SEQ ID NO:2.

10. (Currently amended) ~~A fragment~~ The fragment as recited in ~~claim 1 or claim 8~~ claim 1 having an antigenic determinant in common with ~~the polypeptide of claim 1(i)~~ SEQ ID NO:2, which consists of 7 or more ~~(for example, 8, 10, 12, 14, 16, 18, 20 or more)~~ amino acid residues from the sequence SEQ ID NO:2.

11. (Currently amended) ~~A fragment~~ The fragment according to claim 10 comprising amino acid residues 24 to 421 of SEQ ID NO:2.

12. (Currently amended) ~~A fragment~~ The fragment according to claim 10 comprising amino acid residues 24 to 229 of SEQ ID NO:2.

13. (Currently amended) A fusion protein ~~comprising:~~ selected from the group consisting of

~~1)~~ a ligand binding domain derived from a polypeptide according to ~~any one of claims 1 to 8~~ claim 1 and a transmembrane domain derived from another member of the 5-HT3 receptor group~~; or~~

~~2)~~ and a transmembrane domain derived from a polypeptide according to ~~any one of claims 1 to 8~~ claim 1 and a ligand binding domain derived from another member of the 5-HT3 receptor group.

14. (Currently amended) ~~A fusion protein~~ The fusion protein according to claim 13, ~~part 1)~~ comprising the amino acid sequence as recited in SEQ ID NO:23 or ~~a fusion protein according to claim 13, part 2) comprising the amino acid sequence as recited in~~ SEQ ID NO:24.

15. (Currently amended) A purified nucleic acid molecule which encodes a polypeptide, a fragment, or a functional equivalent according to ~~any one of the preceding claims~~ claim 1.

16. (Currently amended) ~~A purified~~ The purified nucleic acid molecule according to claim 15, which has the nucleic acid sequence as recited in SEQ ID NO:1, or is a redundant equivalent or fragment thereof.

17. (Currently amended) A purified nucleic acid molecule which hybridises under high stringency conditions with a nucleic acid molecule according to claim 15 ~~or claim 16~~.

18. (Currently amended) A vector comprising a nucleic acid molecule as recited in ~~any one of claims 15-17~~ claim 15.

19. (Original) A host cell transformed with a vector according to claim 18.

20. (Currently amended) A ligand which binds specifically to, and which ~~preferably~~ modulates the activity of, a polypeptide according to ~~any one of claims 1-14 as a member of the 5-HT3 receptor group~~ claim 1.

21. (Currently amended) A ligand ~~according to claim 20~~ which binds specifically to the ligand binding domain or the pore forming domain of a polypeptide according to ~~any one of claims 1-14~~ claim 1.

22. (Original) A ligand according to claim 21, which is an antibody.

23. (Currently amended) A compound that either increases or decreases the level of expression or activity of a polypeptide according to ~~any one of claims 1-14~~ claim 1.

24. (Currently amended) A compound according to ~~claim 23 that binds to a polypeptide according to any one of claims 1-15 without inducing~~ claim 23 that does not induce any of the biological effects of the polypeptide.

25. (Original) A compound according to claim 24, which is a natural or modified substrate, ligand, enzyme, receptor or structural functional mimetic.

26. (Canceled)

27. (Currently amended) A method of ~~diagnosing~~ detecting a disease in a patient, comprising the steps of assessing the level of expression of ~~a natural gene encoding a polypeptide according to any one of claims 1-14~~, or assessing the activity ~~of a~~ of, a polypeptide according to ~~any one of claims 1-14,~~ claim 1 in tissue from said patient and comparing said level of expression or activity to a control level, wherein a level that is different to said control level is indicative of disease.

28. (Currently amended) ~~A method~~ The method according to claim 27 that is carried out *in vitro*.

29. (Currently amended) ~~A method~~ The method according to claim 27 ~~or claim 28~~, which further comprises the steps of: (a) contacting a ligand ~~according to any one of claims 20 to 22~~ with a biological sample under conditions suitable for the formation of a ligand polypeptide complex; and (b) detecting said complex.

30. (Currently amended) ~~A method~~ The method according to claim 27 ~~or claim 28~~, further comprising the steps of:

a) contacting a sample of tissue from the patient with a nucleic acid probe under stringent conditions that allow the formation of a hybrid complex between a nucleic acid molecule ~~according to any one of claims 15-17~~ and the probe;

b) contacting a control sample with said probe under the same conditions used in step a); and

c) detecting the presence of hybrid complexes in said samples; wherein detection of levels of the hybrid complex in the patient sample that differ from levels of the hybrid complex in the control sample indicative of disease.

31. (Currently amended) A method according to claim 27 ~~or claim 28~~, comprising:

a) contacting a sample of nucleic acid from tissue of the patient with a nucleic acid primer under stringent conditions that allow the formation of a hybrid complex between a nucleic acid molecule ~~according to any one of claims 15-17~~ and the primer;

b) contacting a control sample with said primer under the same conditions used in step a); and

c) amplifying the sampled nucleic acid; and

d) detecting the level of amplified nucleic acid from both patient and control samples;

wherein detection of levels of the amplified nucleic acid in the patient sample that differ significantly from levels of the amplified nucleic acid in the control sample is indicative of disease.

32. (Currently amended) ~~A method~~ The method according to claim 27 ~~or claim 28~~ comprising:

a) obtaining a tissue sample from a patient being tested for disease;

b) isolating a nucleic acid molecule ~~according to any one of claims 15-17~~ from said tissue sample; and

c) diagnosing the patient for disease by detecting the presence of a mutation which is associated with disease in the nucleic acid molecule as an indication of the disease.

33. (Original) The method of claim 32, further comprising amplifying the nucleic acid molecule to form an amplified product and detecting the presence or absence of a mutation in the amplified product.

34. (Currently amended) The method of ~~either claim 32 or 33~~ claim 32, wherein the presence or absence of the mutation in the patient is detected by contacting said nucleic acid molecule with a nucleic acid probe that hybridises to said nucleic acid molecule under stringent conditions to form a hybrid double-stranded molecule, the hybrid double-stranded molecule having an unhybridised portion of the nucleic acid probe strand at any portion corresponding to a mutation associated with disease; and detecting the presence or absence of an unhybridised portion of the probe strand as an indication of the presence or absence of a disease-associated mutation.

35. (Currently amended) ~~A method~~ The method according to ~~any one of claims 27-34~~ claim 27, wherein said disease includes, but is not limited to, nausea, vomiting, pain, eating disorders, alcoholism, psychosis, side effects of various anticancer therapies, irritable bowel syndrome, gastrointestinal related disorders, Alzheimer's disease, Parkinson's disease, Huntingtons Chorea, cognitive disorders, behavioral disorders and phobias such as anxiety related illnesses and addiction, obsessive compulsive behavior, memory and learning disorders, depression and panic disorders, asthma, inflammation, sexual dysfunction, disorders of the neuroendocrine and cardiovasular systems.

36. (Currently amended) ~~A method~~ The method according to ~~any one of claims 27-34~~ claim 27, wherein said disease ~~includes diseases~~ is a disease associated with T cells. ~~such as inflammatory bowel diseases (including Crohns disease and ulcerative colitis), multiple sclerosis,~~

~~psoriasis, rheumatoid arthritis, thrombocytopenia, type I diabetes mellitus, asthma, atopic dermatitis, atopic rhinitis and conjunctivitis, diseases associated with T-cell proliferation such as leukaemias, diseases associated with T-cell depletion such as HIV infection, chemotherapy and radiiotherapy, and diseases where regulation of T cell activation is required, such as cancers, viral infections, bacterial infections (including tuberculosis) and fungal infections.~~

37. (Currently amended) ~~Use of a polypeptide according to any one of claims 1-14 as a member of the 5HT-3 receptor group~~ The disease of claim 36, wherein the disease is cancer or HIV infection.

38. (Currently amended) A pharmaceutical composition comprising a polypeptide according to ~~any one of claims 1-14~~ claim 1, a nucleic acid molecule according to ~~any one of claims 15-17~~ claim 15, a vector according to claim 18, a host cell according to claim 19, a ligand according to ~~any of claims 20 to 22~~ claim 20, or a compound according to ~~any one of claims 23-25~~ claim 23.

39. (Currently amended) A vaccine composition comprising a polypeptide according to ~~any one of claims 1-14~~ claim 1 or a nucleic acid molecule according to ~~any one of claims 15-17~~ claim 15.

40. (Canceled)

41. (Currently amended) ~~A polypeptide according to any one of claims 1-14, a nucleic acid molecule according to any one of claims 15-17, a vector according to claim 18, a host cell according to claim 19, a ligand according to any one of claims 20 to 22, a compound according to any one of claims 23-25, or a pharmaceutical composition according to claim 38, for use in the manufacture of a medicament~~ The pharmaceutical composition of claim 38 administered for the treatment of diseases associated ~~T cells such as~~ with T cells, ~~inflammatory bowel diseases (including Crohns disease and ulcerative colitis), multiple sclerosis, psoriasis, rheumatoid arthritis, thrombocytopenia type I diabetes mellitus, asthma, atopic dermatitis, atopic rhinitis and conjunctivitis, diseases associated with T cell proliferation such as leukaemias, diseases assocaited with T cell depletion such as HIV infection, chemotherapy and radiotherapy, and diseases where~~

~~regulation of T cell activation is required, such as cancers, viral infections, bacterial infections (including tuberculosis) and fungal infections~~ with T cells, T cell proliferation, or T cell regulation.

42. (Currently amended) A method of treating a disease in a patient, comprising administering to the patient a polypeptide according to ~~any one of claims 1-14~~ claim 1, a nucleic acid molecule according to ~~any one of claims 15-17~~ claim 15, a vector according to claim 18, a host cell according to claim 19, a ligand according to ~~any one of claims 20 to 22,~~ claim 20, or a compound according to ~~any one of claims 23-25~~ claim 23 ~~or a pharmaceutical composition according to claim 38~~.

43. (Currently amended) ~~A method~~ The method according to claim 42, wherein, for diseases in which the expression of the natural gene or the activity of the polypeptide is lower in a diseased patient when compared to the level of expression or activity in a healthy patient, the polypeptide, nucleic acid molecule, vector, ligand, compound or composition administered to the patient is an agonist.

44. (Currently amended) ~~A method~~ The method according to claim 42, wherein, for diseases in which the expression of the natural gene or activity of the polypeptide is higher in a diseased patient when compared to the level of expression or activity in a healthy patient, the polypeptide, nucleic acid molecule, vector ligand, compound or composition administered to the patient is an agonist.

45. (Currently amended) A method of monitoring the therapeutic treatment of disease in a patient, comprising monitoring over a period of time the level of expression or activity of a polypeptide according to ~~any one of claims 1-14~~ claim 1, or the level of expression of a nucleic acid molecule according to ~~any one of claims 15-17~~ claim 15 in tissue from said patient, wherein altering said level of expression or activity over the period of time towards a control level is indicative of regression of said disease.

46. (Currently amended) A method for the identification of a compound that is effective in the treatment and/or ~~diagnosis~~ detection of disease, comprising contacting a polypeptide

according to ~~any one of claims 1-14~~ claim 1, or a nucleic acid molecule according to ~~any one of claims 15-17~~ claim 15 with one or more compounds suspected of possessing binding affinity for said polypeptide or nucleic acid molecule, and selecting a compound that binds specifically to said nucleic acid molecule or polypeptide.

47. (Currently amended) A kit useful for diagnosing disease comprising a first container containing a nucleic acid probe that hybridises under stringent conditions with a nucleic acid molecule according to ~~any one of claims 15-17;~~ claim 15, a second container containing primers useful for amplifying said nucleic acid molecule; and instructions for using the probe and primers for facilitating the diagnosis of disease.

48. (Original) The kit of claim 47, further comprising a third container holding an agent for digesting unhybridised RNA.

49. (Currently amended) A kit comprising an array of nucleic acid molecules, at least one of which is a nucleic acid molecule according to ~~any one of claims 15-17~~ claim 15.

50. (Currently amended) A kit comprising one or more antibodies that bind to a polypeptide as recited in ~~any one of claims 1-14;~~ claim 1 and a reagent useful for the detection of a binding reaction between said antibody and said polypeptide.

51. (Currently amended) A transgenic or knockout non-human animal that has been transformed to express higher, lower or absent levels of a polypeptide according to ~~any one of claims 1-14~~ claim 1.

52. (Original) A method for screening for a compound effective to treat disease, by contacting a non-human transgenic animal according to claim 51 with a candidate compound and determining the effective of the compound on the disease of the animal.